1 MEG XL

1 MEGABYTE
RAM CARD
FOR ATARI
800XL
1200XL
COMPUTERS
INCLUDES
UTILITIES
SOFTWARE

(RAM NOT INCLUDED)

1MEG XL INSTALLATION

CAUTION: This product should only be installed by persons with proper training in the art of soldering. Newell Industries will not be held responsible for damage to the computer due to neglect or carelessness. Read these instructions completely before beginning.

The 1 MEG upgrade can be installed using different combinations of bits of the $D301 address port of the 6520 PIA. The 130XE uses bit 4 (low) to enable Main cpu banking, and bit 5 to enable Antic (screen pro.) banking. It uses bits 2 & 3 to determine which of the four 16K banks is active. The 130XE uses 2 sets of ram banks and flip flops the CAS line to activate the banked memory. We use the same method to bank into the 1 meg of ram. See below. After installation, your XL will be functionally compatible with the upgraded XE.

$D301 PIA PORT B BIT ASSIGNMENTS (UNMODIFIED 130XE)
    BIT 0-O.S. ROM CONTROL, 1=ROM, 0=RAM
    BIT 1-BASIC ROM CONTROL, 1=RAM, 0=ROM/NO CONNECT ON 1200XL
    BIT 2-RAM BANK SELECT, 1=RAM, 0=RAM/NO CONNECT ON XL
    BIT 3-RAM BANK SELECT, 1=RAM, 0=RAM/NO CONNECT ON XL
    BIT 4-CPU BANK ENABLE, 1=NOT ENABLED, 0=ENABLED/NO CONNECT ON XL
    BIT 5-ANTIC BANK ENABLE, 1=NOT ENABLED, 0=ENABLED/NO CONNECT ON XL
    BIT 6-NOT USED
    BIT 7-DIA.ROM CONTROL, 1=RAM, 0=ROM

GENERAL INSTALLATION

The ribbon cable H2 wires (RED)1=HALT, 2=DEL, 3=REF, 4=AB0, 5=AB1, 6=AB2, 7=AB3, 8=AB4, 9=AB5, 10=AB6, 11=CAS0, 12=CASI, 13-14=SPARE.
The ribbon cable H3 wires (RED)1=A14, 2=A15, 3=A6, 4=A7, 5=SPARE, 6=S, 7-14=D7-D0.
1.Disassemble computer and remove the motherboard. Install eight 1meg ram chips on the 1 meg board, U1-U8, notch towards the caps.
1200XL ONLY
A.Cut trace to pin 3 of U7. Cut trace to pin 11 of U10. Cut trace to pin 13 of U10.
NOTE:Make these changes on the bottom of the mother board.
B.Install jumper wire from CPU address A7 to U10 pin 11. A7 is the trace that was going to U7 pin 3.
C.Install jumper wire from CPU address A13 to U7 pin 3. A13 is the trace that was going to U10 pin 13.
D.Install jumper wire from CPU address A14 to U10 pin 13. A14 is the trace that was gonig to U10 pin 11.
E.Test computer before preceeding.
2.Remove the ram chip from U13(800XL), U6(1200XL). Install H1 cable in U13 or U6. Make sure that pin 1 matches up. Solder or socket. Install the 64K ram chip in U17. Fold the cable and place the 1 meg board on top of the motherboard component side up.
3.Connect D0-D7 data lines to pins 30-33 and 40-37 of the Antic rom. Cut these wires so there is not a lot of excess slack in the wires. But don't make them tight.
4.Connect REF to pin 8 of Antic. Connect HALT to pin 9 of Antic. Connect DEL to pin 9 of U30(800XL), U25(1200XL).
5.Remove pin 8(CAS) of U30(800XL), U25(1200XL). Connect CAS0 where you removed the pin. Connect CASI to pin 8.
6.Connect A6 to Antic pin 26, connect A7 to pin 25, connect A14 to pin 19, connect A15 to pin 20. Connect S to pin 10 of U29(800XL), U22(1200XL).
7.Install the control lines per preferred method listed, or any other way you like.
8.Make sure that the 1meg board is not shorting to anything and turn the computer on. If installation was done properly the computer should come up in the same manner that it did before this installation was done. If not, correct the problem (see trouble shooting) and try again.
9.When putting the computer back together, use extreme caution to make sure that the 1meg board does not short out anything. You may not be able to install the top RF sheild. Don't force it.

Installation of control lines and board configuration

Method 1
This method is compatable with Basic XE, the translator disk, and any other software that requires bit 0 to remain in its normal configuration. This method does allow Antic control via bit 5. With this method, internal basic is lost via software control. This is probably the most compatible method, and the one that I use and reccomend.

$D301 PIA PORT B BIT ASSIGNMENTS (METHOD 1)

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BIT 0-O.S. ROM CONTROL, 1=ROM, 0=RAM
BIT 1-RAM BANK SELECT, 1=RAM, 0=RAM (SEE BELOW)
BIT 2-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 3-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 4-CPU BANK ENABLE, 1=NOT ENABLED, 0=ENABLED
BIT 5-ANTIC BANK ENABLE, 1=DISABLED, 0=ENABLED / RAM BANK SELECT, 1=RAM, 0=RAM
BIT 6-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 7-RAM BANK SELECT, 1=RAM, 0=RAM (SEE BELOW)
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1.On the PIA, remove pins PB1(11), and PB7(17) from the motherboard and bend them out. Be careful not to damage the motherboard or break the pins off at the IC.
2.Connect a toggle, or momentary switch between PB7 pin 17 and motherboard where PB7 was connected. Not required on standard 1200XL.
NOTE:This switch must be closed during power up (Atari and Omniview OS's) until you get a screen. It can be left off with OSNXL. If you want to use the internal diagnostics, or if you go into omnimon of the OSNXL, the switch must be on (closed). It must also be on while you go into 80 columns of omniview. Turn it off (open) all other times.
3.Connect wires AB0 to PIA PB7(pin 17), AB1 to PB1(11), AB2 to PB2(12), AB3 to PB3(13), AB4 to PB4(14), AB5 to PB5(15), AB6 to PB6(16).
4.To be able to select the internal basic (800xl), connect a toggle switch between ground and the motherboard where PB1 was removed. The switch is not much different than the Option Key, and I found it more versatile.
5.Jumper J1 on 1 meg board.

Method 2
     This method is compatable with Basic XE, the translator disk, and any other software that requires bits 0 and 1 to remain in their normal configuration. This method does not allow Antic control. If Antic addresses the banked memory area ($4000-$7FFF), it will see the banked memory currently there. Okay, here's what we do. We are going to to connect the lines that normally go to the enable bits to ground. This will mean that the 1 meg banked memory area is always active, so we are going lose the 16K bank of main memory, and replace it with 16K of the banked memory. This will cost you 16K of ramdisk for a total of 1008K available.

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$D301 PIA PORT B BIT ASSIGNMENTS (METHOD 2)
BIT 0-O.S. ROM CONTROL, 1=ROM, 0=RAM
BIT 1-BASIC ROM CONTROL, 1=RAM, 0=ROM
BIT 2-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 3-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 4-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 5-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 6-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 7-RAM BANK SELECT, 1=RAM, 0=RAM (SEE BELOW)
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1.On the PIA, remove PB7 from the motherboard and bend it out. Be careful not to damage the motherboard or break the pin off.
2.Connect a toggle, or momentary switch between PB7 pin and board.
NOTE:See note in method 1.
3.Connect wires AB0 to PB7, AB1 to PB4, AB2 to PB2, AB3 to PB3, AB4 to Ground, AB5 to PB5, AB6 to PB6.
4.On the 1 meg board, jumper J1 OPEN (no jumper)

Method 3
     This method is NOT compatable with Basic XE, the translator disk, or any other software that requires bits 0, and/or 1 to remain in its normal configuration. This method does allow Antic control via bit 5. With this method, internal basic is lost via software control. Access to the ram under the OS is also lost.

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$D301 PIA PORT B BIT ASSIGNMENTS (METHOD 3)
BIT 0-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 1-RAM BANK SELECT, 1=RAM, 0=RAM (SEE BELOW)
BIT 2-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 3-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 4-CPU BANK ENABLE, 1=NOT ENABLED, 0=ENABLED
BIT 5-ANTIC BANK ENABLE, 1=DISABLED, 0=ENABLED / RAM BANK SELECT, 1=RAM, 0=RAM
BIT 6-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 7-DIA. ROM CONTROL, 1=RAM, 0=ROM
```

1.On the PIA, remove pins PB0, and PB1 from the motherboard and bend them out. Be careful not to damage the motherboard or break the pins off.
2.Connect wires AB0 to PB0, AB1 to PB1, AB2 to PB2, AB3 to PB3, AB4 to PB4, AB5 to PB5, AB6 to PB6.
3.To be able to select the internal basic (800XL), connect a toggle switch

between ground and the motherboard where PB1 was removed.

Helpful hints:
If you have read these instructions and do not understand them, then do not attempt this installation without assistance. For assistance, you may call Newell Industries between 9 and 5 CT. Collect calls will not be accepted. Plan the routing of the jumper wires before you start. If you feel that you cannot do the installation yourself, and cannot find anyone locally to do it, Newell Industries will install the upgrade for $30.00 plus shipping.

TROUBLE SHOOTING

1. BLANK SCREEN
This could be caused by numerous things. Did you close the PB7 switch? Check all ICs for bent pins. Check for shorts in soldering. To isolate problem, remove the 1meg board. If you have used method 2, remove the grounds for bank enabling and power up again. If problem is in 1meg board, system should come up normally.

2. MYDOS WILL NOT BOOT-ERROR MESSAGES DURING TEST RUN
Check solder connections for bad solder joints or shorts. Check AB0-AB6 to proper pins.

3. UNKNOWN
The chances of your having a defective 1 meg board are very small. THE MOST COMMON CAUSE FOR PROBLEMS ARE IMPROPER INSTALLATION. If you have double checked your installation and it still does not work, contact Newell Industries for further assistance.

WARRANTY

Newell Industries will repair or replace any defective part for a period of ninety days from date of purchase at no charge. This excludes parts that have been mishandled or modified in any way.

If you have installed the 1 meg upgrade in your computer and cannot get it to function properly, you may send your computer to Newell Industries and it will be repaired and returned to you at no charge if it is determined that the upgrade parts are defective. If improper installation is the cause of the failure, Newell Industries will correct the installation and return the tested board to you COD for charges.

USING YOUR 1MEG RAM

There is a simple program that checks one byte of each bank of memory to insure that they are working. It is on the disk furnished. The filename is "MxTEST1M.BAS" (x reffering to installation method 1,2, or 3). When this program is ran, it should come back with "TEST COMPLETE, 0 ERRORS". If you get any ERROR messages back, refer to the trouble shooting section. CAUTION, reboot your system after running this program. It alters memory, and may have some undesirable affects if the system is not rebooted.

MYDOS DISK OPERATING SYSTEM

The MYDOS disk operating system 4.50 M1 furnished with the 1meg upgrade is a patched version of 4.50. The patch was made to correct a problem in the ramdisk handler that would not allow the use of bits 0 and 1. Refer to the Mydos manual for setting up the various types of ramdisks available. The page sequence table in mydos starts at $0BBA and is high nibble C,A,8,6,4,2,0,E by low nible 1,3,5,7,9,B,D,F as shipped with this upgrade configured for method 1 installation.

M1COPY SECTOR COPIER

This program was designed to be used with the method 1 installation of the 1 meg upgrade. It should not be used with any other computer unless it is verified that it uses the same bank switching methods. The program resides at $8500, once loaded may be reran using the M option of DOS to run at $8500 (assuming it has not be overwritten by another program).

The ramdisk page sequence of the MYDOS with the upgrade is such that the copy program may be ran and copy as many disk as you like and return to DOS without loosing the RD directory including DUP.SYS and MEM.SAV. The ramdisk will not even know that part of it was used. Of course, if the ramdisk is full, you will loose the files in the last portion depending on the size of disk you copy. The page sequence for m1copy is high nibble 0,2,4,6,8,A,C,E by low nibble 1,3,5,7,9,B,D,F. Copying a 720K disk will only go up to the A7 bank thus

leaving the normal 130XE banks and the dos lower ramdisk banks alone.

Use the 'L' command from DOS to load M1COPY. If you are going to copy 80 track or double sided diskettes, your disk drives must be configured prior to running the program. The program can be loaded from the ramdisk if you need to configure your drives. M1copy uses ONLY the banked memory area for copying, so nothing special is required.

The first prompt. **HOW MANY COPIES?**
Enter how many copies you want (1-99) and, if needed, the special characters to pass information to the program.

SPECIAL CHARACTERS
A "D" entered after the number of copies (exp. 25D) indicates that the diskette you are going to copy is a double density diskette.

A "Q" indicates that you want to copy 1440 sectors per diskette. (exp. 25DQ) This could be a 40 track double sided, 80 track single sided, or 80 track double sided diskette that you only want to copy the first 1440 sectors. Remember that the format option will format the new diskette to the configuration of the drive.

An "O" indicates that the diskette you are going to copy has 2880 sectors. (exp. 25DO) This would be an 80 track double sided diskette.

An "H" indicates that you just want to copy the first portion of the diskette, including the directory (369 sectors). (exp. 25H) This example would copy the first 369 sectors of any single density diskette.

NOTE: The last character entered will be the one used by the program. (exp. 1DHQ translates to 1DQ, 99QOHD translates to99HD) A "Return" without a specified number of copies will be interpreted as 153. (exp. H translates to 153H) "Return" must be after entry. (exp. 1H"Return")
SOURCE DRIVE?
Enter the drive number where you will put the diskette to be copied. (1-4) Do not press "Return". Drive density is automatically set on source disk.

DESTINATION DRIVE?
Enter the drive number that you will use to write the copies to. (1-4) Do not press "Return". Drive density must match source diskette. Using the same drive for source and destination will insure that the density matches.

VERIFY WRITES (Y OR N)
Press "Y" if you want to write with verify. This takes about 3 times longer to copy a diskette and is normally not used unless you have some very important diskettes to back up.

FORMAT (Y or N)?
Press "Y" if you want the destination diskette formatted automatically with every copy. Otherwise press "N". Do not press "Return".
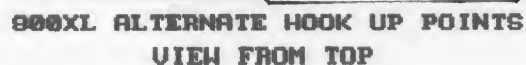
INSERT SOURCE DISK, PUSH START
Follow this prompt to read your source diskette.

INSERT DESTINATION DISK, PUSH START
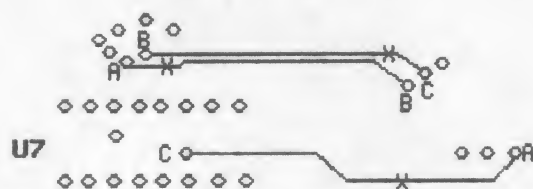Follow this prompt to write your copies.

UNREADABLE SECTORS
If unreadable sectors are encountered, after a few tries, the program will continue to the next sector, using whatever data it got from the bad sector to write to the destination disk, until the end sector is reached. This program is not intended to copy copy protected diskettes. Be aware that it is illegal to copy copyrighted software for any purpose other than backup.

TO RAM & U30
PIN 8

4 3 3 3   3 3 3 3 3   2 6   2 5   2 0   19   8
0 9 8 7   3 2 1 9 0

ANTIC CO21697 or CO12296

800XL ALTERNATE HOOK UP POINTS
VIEW FROM TOP

NOT TO SCALE

VIEW FROM BOTTOM

U7

1200XL ONLY
CUT TRACES MARKED X, CONNECT A-A, B-B, C-C